

R E M A R K S

The Office Action of August 29, 2002, presents the examination of claims 1-4, 6-7, 9-18, 30-36, 40-41, and 43-44. Claims 2, 3, 10, and 14 are canceled. Claims 1, 4, 7, 11, 15, 30, 32, 36, 40, 41, 43, and 44 are amended. No new matter is inserted into the application.

Claim Objections

The Examiner objects to claims 43 and 44 for reciting "An isolated nucleic acid of claim 1...." Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant objection are respectfully requested.

The Examiner states that the objection may be overcome and claims 43 and 44 allowable if the claims are rewritten into independent form. In response to the Examiner's remarks, Applicants amend claims 43 and 44 into independent form as suggested by the Examiner. The Examiner is respectfully requested to acknowledge the allowability of these claims.

Rejection under 35 U.S.C. § 112, first paragraph

The Examiner maintains the rejection of claims 1-4, 7, 10-11, 14-16, 30-36, and 40-41 under 35 U.S.C. § 112, first paragraph for an alleged lack of written description in the specification. Claims 2, 3, 10, and 14 are canceled, thus

rendering rejection thereof moot. Applicants respectfully traverse the rejection applied to the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner states, "It remains unclear that Applicants have adequately described the genus of plant raffinose synthase genes...." The claims are amended so that the genus of nucleic acids claimed have the specific nucleotide sequences (a) to (h) which encode amino acid sequences of raffinose synthase genes, or a nucleotide sequence hybridizable to a nucleotide sequence complementary to the nucleotide sequence of any one of (a) to (h) under conditions of 0.9 M NaCl, 0.09 M citric acid at 65°C.

Applicants respectfully submit that the amended claims are equivalent to Example 9 of the USPTO "Revised Interim Written Description Guidelines Training Materials." Example 9 of the Training Materials addresses claims that recite the invention in terms of hybridization to a reference sequence. Thus, Example 9 is relevant to the instant claims 1, 30, 32, 36, 40, and 41.

The claim in Example 9 states:

An isolated nucleic acid that specifically hybridizes under highly stringent conditions to the complement of the sequence set forth in SEQ ID NO: 1, wherein said nucleic acid encodes a protein that binds to a dopamine receptor and stimulates adenylate cyclase activity.

This claim language is identical in its general content to that of the instant amended claims. The hybridization conditions

set forth in the instant claims are highly stringent. Reference sequences are set forth in the instant claims, as well as a biological activity of a protein.

The disclosure in the instant specification is even more extensive than that described in Example 9. Specifically, in Example 9, the specification discloses only one cDNA that encodes a protein that has the biological activity recited in the claims. On the other hand, in the present application the Inventors have described four variant cDNAs, obtained from four different plant species, that encode proteins having the desired activity. The inventors have further provided examples of PCR primers and detailed description of how to use them to isolate additional examples of isolated DNA encoding raffinose synthase from other species. Working examples (7 and 9-11) of use of the PCR primers to perform such isolations are provided.

For all of the above reasons, Applicants respectfully submit that the instant claims, as amended, fully comply with the requirements of 35 U.S.C. § 112, first paragraph. Thus, the rejection for alleged lack of adequate written description of the claimed invention should be withdrawn.

Rejection under 35 U.S.C. § 102

The Examiner maintains the rejection of claims 1-4, 7, 10-11, 14-16, 30-36, and 40-41 under 35 U.S.C. § 102(e) for allegedly being anticipated by Osumi '292 (U.S. Patent

6,166,292). Claims 2, 3, 10, and 14 are canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the rejection applied to the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Applicants respectfully point out that the Examiner's understanding of 35 U.S.C. § 102(e) is incorrect. The Examiner states, "[T]he issue of 35 U.S.C. 102(e) is the earlier U.S. filing date of Osumi et al. Applicant's perfection of a claim to foreign priority does not overcome this rejection." The Examiner is incorrect. MPEP 706.02(b) states that a rejection under 35 U.S.C. § 102(e) may be overcome by perfecting a claim to priority under 35 U.S.C. § 120.

The Examiner also states, "In the instant case the invention of Osumi et al is presumed to precede Applicant's invention because of the earlier U.S. filing date of Osumi et al." There is no such presumption in 35 U.S.C. § 102(e). The code merely states that an Applicant cannot obtain a patent if another obtains a U.S. patent for the same invention from a U.S. application or international application for a patent which has a filing date prior to Applicants' date of invention. Contrary to the Examiner's assertions, 35 U.S.C. § 102(e) does not state that Applicants' date of invention is presumed to be after "another's" date of invention if "another" filed an U.S. or international application first. Instead, 35 U.S.C. § 102(e) only looks to

"another's" U.S. or international application filing date, rather than "another's" actual date of invention. It is exactly this feature of 35 U.S.C. § 102(e) which allows an Applicant to overcome such a rejection by perfecting a claim to priority under 35 U.S.C. § 120.

The Examiner writes, "In addition, the '292 patent of *Osumi et al* has an earlier foreign priority date than that of the instant application, hence it is presumed that *Osumi et al* was the first to invent." It is erroneous for the Examiner to "presume" that *Osumi et al.* was the first to invent because *Osumi et al.* has an earlier foreign priority date than that of the instant invention. This presumption is contradictory to the holding in *In re Hilmer* 424 F2d 1108 (CCPA 1970). *In re Hilmer* holds that a United States patent is effective as a prior art reference for purposes of a rejection under 35 U.S.C. § 102(e) as only of its effective U.S. filing date, not its priority date accorded under 35 U.S.C. § 119.

Again, the *Osumi* '292 patent was filed on April 28, 1997, and issued on December 26, 2000. The 35 U.S.C. § 102(e) date for *Osumi* '292 is April 28, 1997. The 35 U.S.C. § 102(e) date cannot be pushed back to the Japanese priority filing date of either April 26, 1996 or July 26, 1996 due to the ruling of *In re Hilmer*, discussed above. In the Reply filed on June 6, 2002, Applicants proved priority to their own 35 U.S.C. § 119 priority

date, which is earlier than Osumi's § 102(e) date, thus overcoming the instant rejection.

Finally, Applicants point out that SEQ ID NO:5 of Osumi et al. is an amino acid sequence derived from cucumber. Cucumber is clearly distinct from leguminous plants, lamiaceous plants or monocotyledon. Further claim 2(b) of Osumi et al. describes that the origin of the isolated DNA is an organism having an ability to produce raffinose from sucrose and galactinol. Such an organism is general and is different from leguminous plants, lamiaceous plants or monocotyledon.

For all of the above reasons, Osumi et al. fails to anticipate the present invention as recited in the instant claims. Applicants respectfully request withdrawal of the rejection.

Double patenting

The Examiner provisionally rejects claims 1-4, 6-7, 9-18, 30-36, 40-41, and 43-44 under the doctrine of double patenting for allegedly being unpatentable over claims 1-11 and 16-22 of copending U.S. Application No.: 09/301,766. Claims 1-4, 7, 10-11, 14-16, 30-36, and 40-41 are provisionally rejected under the doctrine of double patenting for allegedly being unpatentable over claims 5-7 and 14-17 of copending U.S. Application No.: 09/612,095. Claims 2, 3, 10, and 14 are canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the

rejection applied to the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

First, Applicants point out that U.S. Application No.: 09/612,095 has been abandoned. Therefore the rejection over said application is rendered moot. Withdrawal of the rejection is respectfully requested.

Second, Applicants will file an appropriate terminal disclaimer over copending U.S. Application No.: 09/301,766 once either the present application or the co-pending application is allowed by the United States Patent and Trademark Office.

Conclusion

Applicants respectfully submit that all of the pending rejections have been addressed and overcome by the above remarks and/or amendments. All of the present claims define patentable subject matter such that this application should be placed into condition for allowance. Early and favorable action on the merits of the present application is thereby requested.

If the Examiner has any questions regarding the above, he is respectfully requested to contact Kristi L. Rupert, Ph.D. (Reg. No. 45,702) at the law offices of Birch, Stewart, Kolasch, & Birch, LLP, telephone number 703-205-8000.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of three (3)

Serial No.: 08/992,914

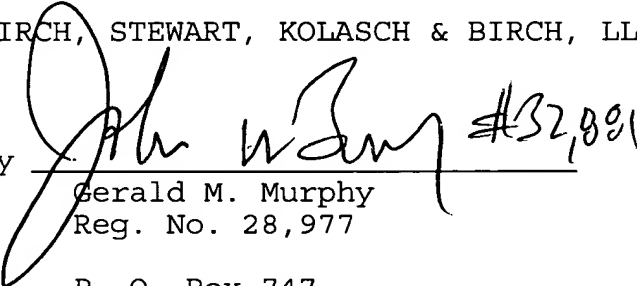
months to February 28, 2003, in which to file a reply to the Office Action. The required fee of \$930.00 is attached to the Notice of Appeal, which is being filed concurrently herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By

 #32,891
Gerald M. Murphy
Reg. No. 28,977

P. O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

KLR
GMM/KLR
0020-4348P

ATTACHMENTS: VERSION WITH MARKINGS TO SHOW CHANGES MADE

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 2, 3, 10, and 14 are canceled.

The following claims are amended:

Claim 1. (Three Times Amended) A nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a D-galactosyl group through an $\alpha(1\rightarrow6)$ bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,
- (d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,
- (e) a nucleotide sequence of SEQ ID NO:5,
- (f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,
- (g) a nucleotide sequence of SEQ ID NO:7,

(h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, and

(i) a nucleotide sequence isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of any one of (a) to (h), in 0.9 M NaCl, 0.09 M citric acid at 65°C.

Claim 4. (Twice Amended) The isolated nucleic acid according to claim 1 [3], wherein the leguminous plant is broad bean.

Claim 7. (Twice Amended) The isolated nucleic acid according to claim 1 [3], wherein the leguminous plant is soybean.

Claim 11. (Twice Amended) The isolated nucleic acid according to claim 1 [10], wherein the lamiaceous plant is Japanese artichoke.

Claim 15. (Twice Amended) The isolated nucleic acid according to claim 1 [14], wherein the monocotyledon is a gramineous plant.

Claim 30. (Four Times Amended) A chimera gene comprising:

a nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a D-galactosyl group through an $\alpha(1\rightarrow6)$ bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,
- (d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,
- (e) a nucleotide sequence of SEQ ID NO:5,
- (f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,
- (g) a nucleotide sequence of SEQ ID NO:7,
- (h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, and
- (i) a nucleotide sequence isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of

any one of (a) to (h), in 0.9 M NaCl, 0.09 M citric acid at 65°C,
and a promoter linked thereto.

Claim 32. (Four Times Amended) A plasmid comprising a nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a D-galactosyl group through an $\alpha(1\rightarrow6)$ bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,
- (d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,
- (e) a nucleotide sequence of SEQ ID NO:5,
- (f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,
- (g) a nucleotide sequence of SEQ ID NO:7,
- (h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, and

(i) a nucleotide sequence isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of any one of (a) to (h), in 0.9 M NaCl, 0.09 M citric acid at 65°C.

Claim 36. (Four Times Amended) A method for metabolic modification, which comprises introducing a nucleic acid isolated from a plant comprising a nucleotide sequence coding for an amino acid sequence of a protein which produces raffinose by combining a D-galactosyl group through an $\alpha(1\rightarrow6)$ bond with a hydroxyl group attached to the carbon atom at position 6 of a D-glucose residue in a sucrose molecule, wherein said nucleotide sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence of SEQ ID NO:1,
- (b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2,
- (c) a nucleotide sequence of SEQ ID NO:3,
- (d) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:4,
- (e) a nucleotide sequence of SEQ ID NO:5,
- (f) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:6,
- (g) a nucleotide sequence of SEQ ID NO:7,

(h) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:8, and

(i) a nucleotide sequence isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said nucleotide sequence is hybridizable with a nucleotide sequence complementary to the nucleotide sequence of any one of (a) to (h), in 0.9 M NaCl, 0.09 M citric acid at 65°C, into a host organism or a cell thereof, so that the content of raffinose family oligosaccharides in the host organism or the cell thereof is changed.

Claim 40. (Twice Amended) An isolated nucleic acid comprising (i) a polynucleotide having a sequence that encodes a protein having an amino acid sequence selected from the group consisting of SEQ ID NOs:2, 4, 6, or 8 [SEQ. ID. NOS:2, 4, 6 or 8] or (ii) a polynucleotide having a sequence complementary to said sequence, or (iii) [comprising] a polynucleotide isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said polynucleotide [that] hybridizes to the polynucleotide (i) or (ii) in 0.9 M NaCl, 0.09 M citric acid at 65°C.

Claim 41. (Twice Amended) An isolated nucleic acid comprising (i) a polynucleotide having a nucleotide sequence

Serial No.: 08/992,914

selected from the group consisting of SEQ ID NOs:1, 3, 5, or 7 [SEQ. ID. NOS:1, 3, 5 or 7] or (ii) a polynucleotide having a sequence complementary to said sequence, or (iii) [comprising] a polynucleotide isolated from a plant selected from the group consisting of leguminous plants, lamiaceous plants, and monocotyledon, said polynucleotide [that] hybridizes to the polynucleotide (i) or (ii) in 0.9 M NaCl, 0.09 M citric acid at 65°C.

Claim 43. (Amended) An isolated nucleic acid comprising a nucleotide sequence coding for [of claim 1, encoding] the amino acid sequence of SEQ ID NO:2 [SEQ. ID. NO.:2].

Claim 44. (Amended) An isolated nucleic acid comprising a nucleotide sequence coding for [of claim 1, encoding] the amino acid sequence of SEQ ID NO:4 [SEQ. ID. NO.:4].